

# FAST SYMBOL TIMING RECOVERY FOR TRANSMITTED DIGITAL DATA

Inventors: Yanbin Yu and Quingyi Zheng

Docket No.: U001 100014

1/7

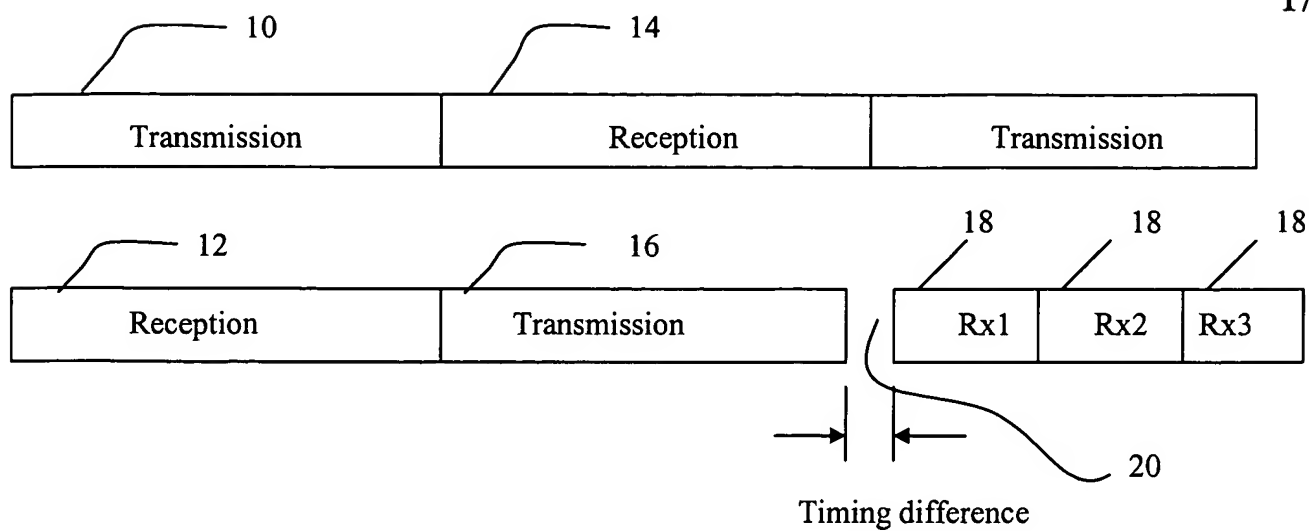


FIG. 1

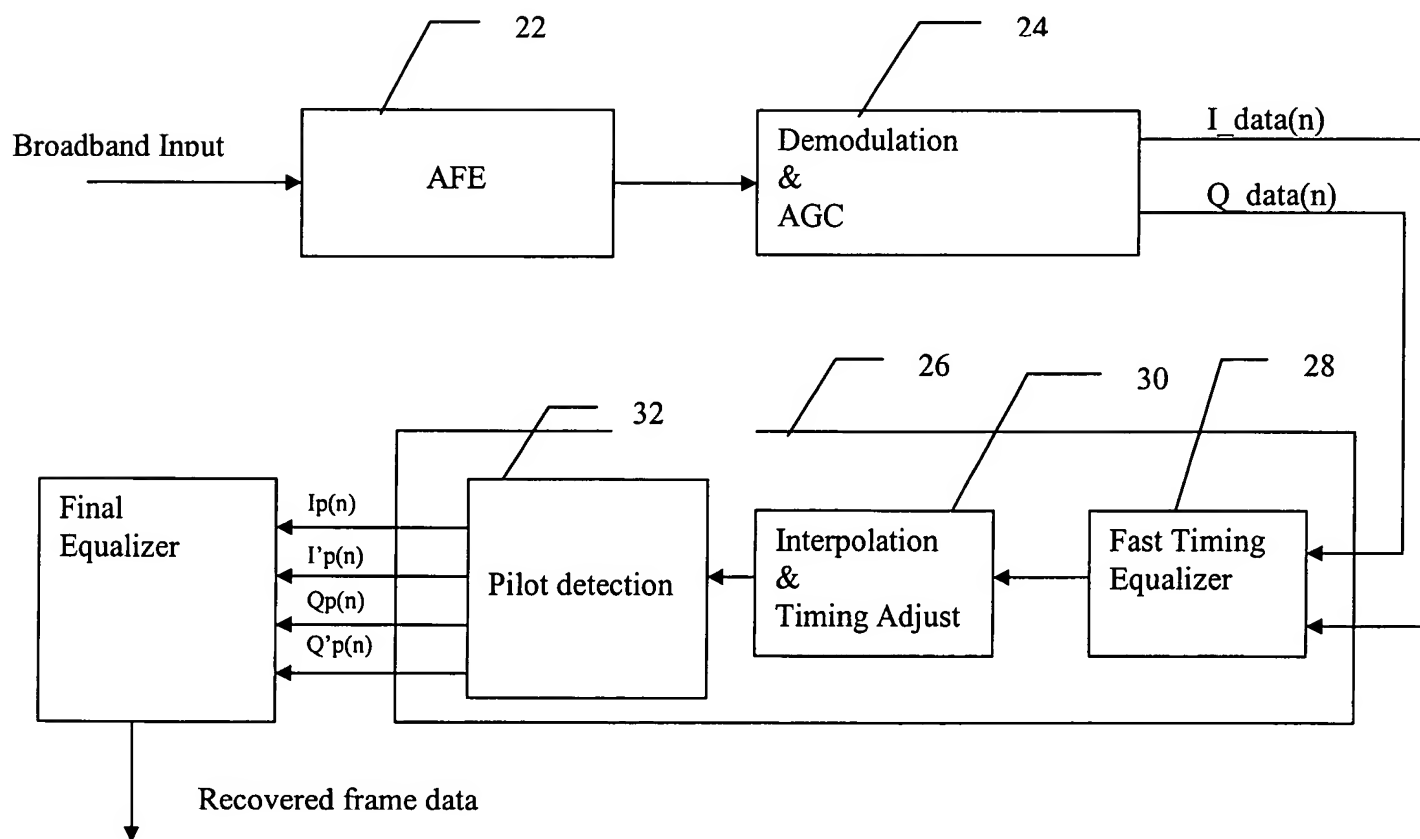


FIG. 2

# FAST SYMBOL TIMING RECOVERY FOR TRANSMITTED DIGITAL DATA

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2/7

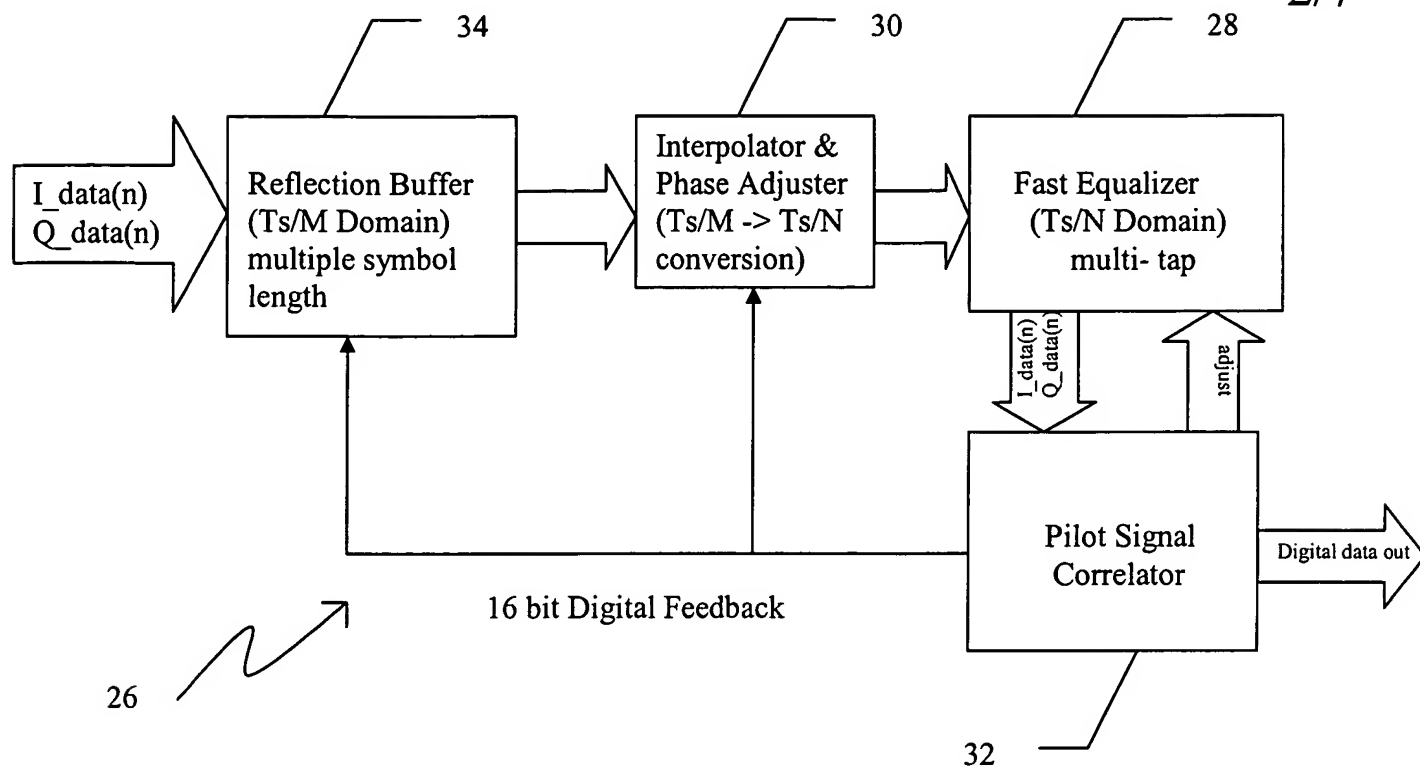


FIG. 3

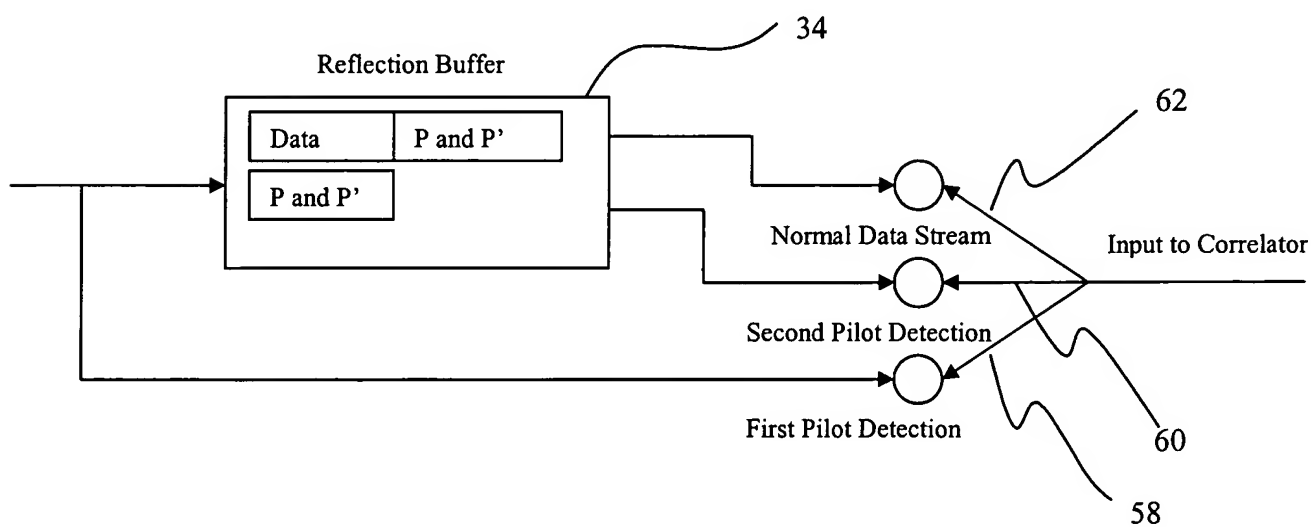


FIG. 5

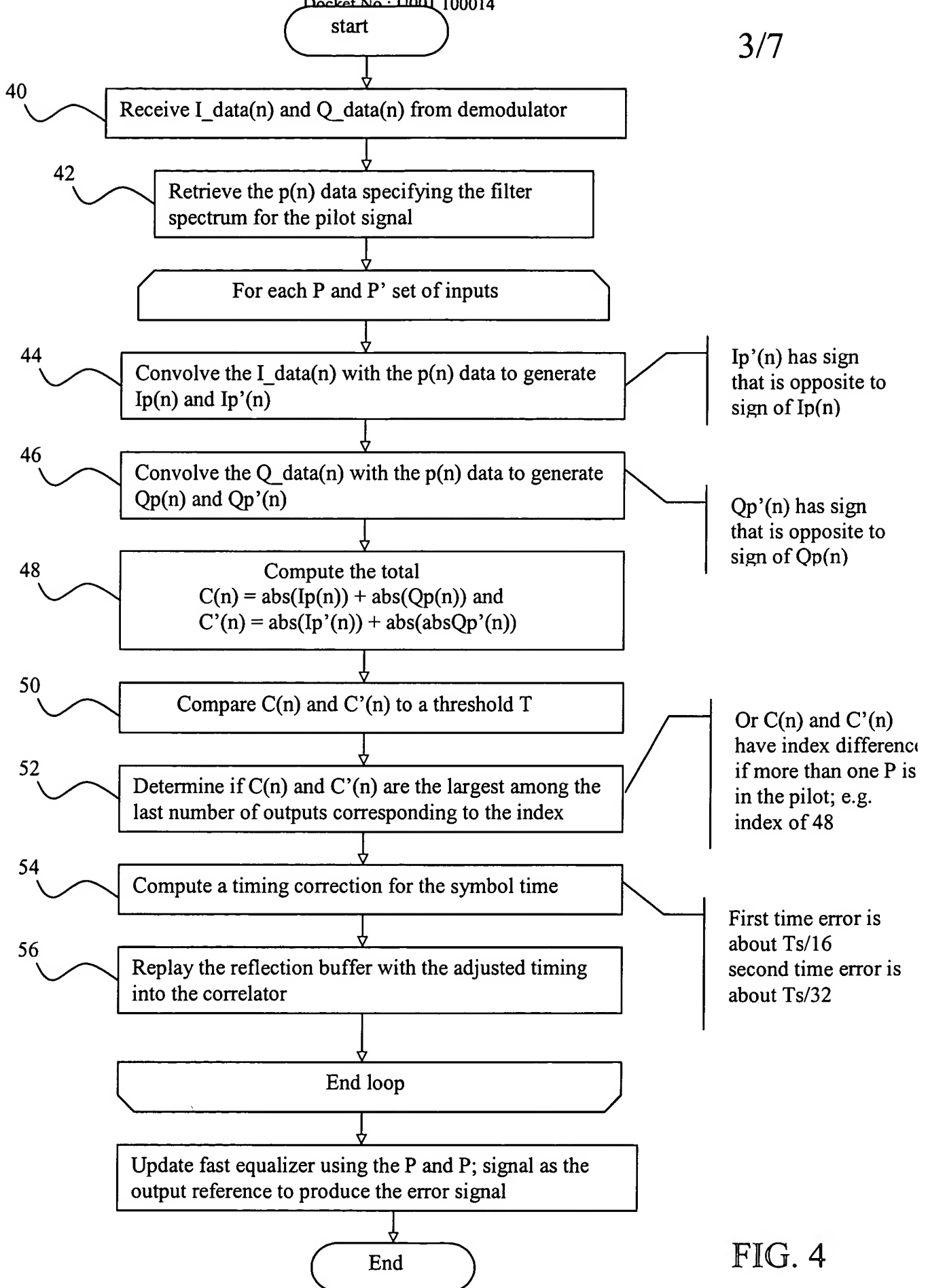


FIG. 4

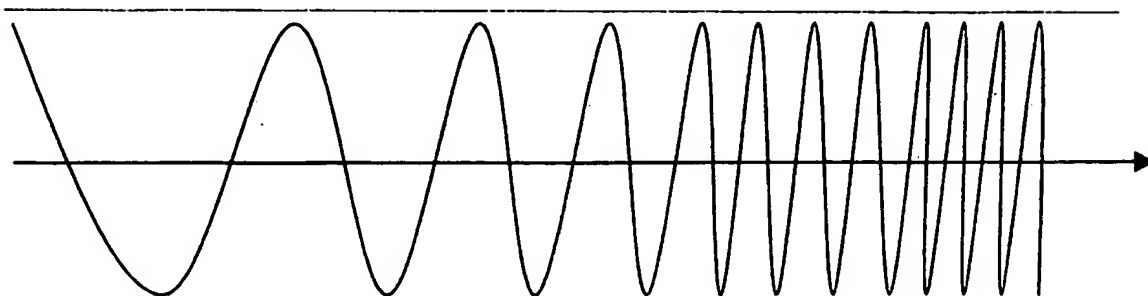


FIG. 6a

Polarity	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	1	1	1	1	0	0	0	1	1	0	1	0	1	0	1	0
1	0	0	0	0	1	1	1	0	0	1	0	1	0	1	0	1

FIG. 6b

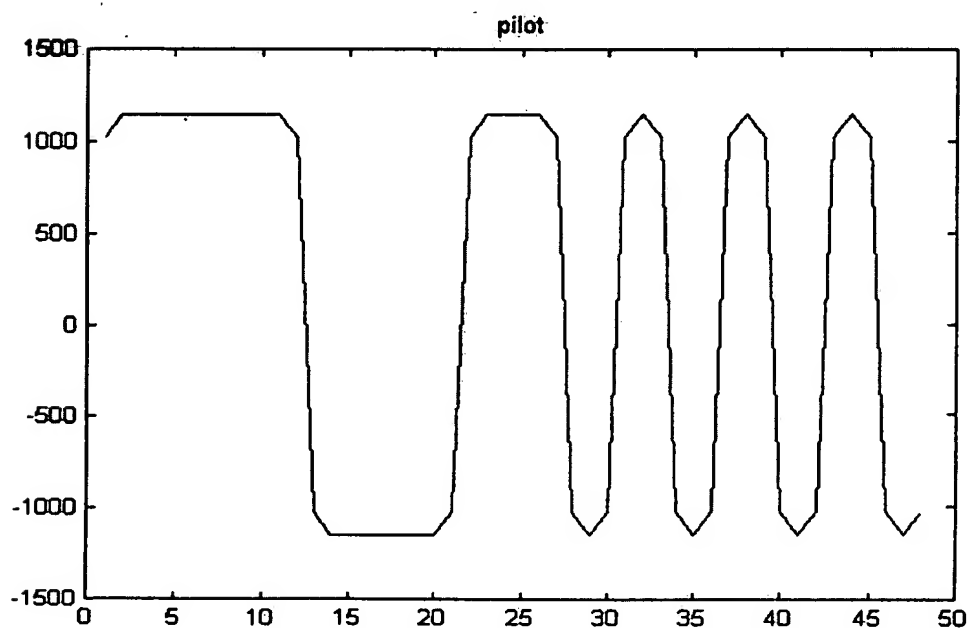


FIG. 6c

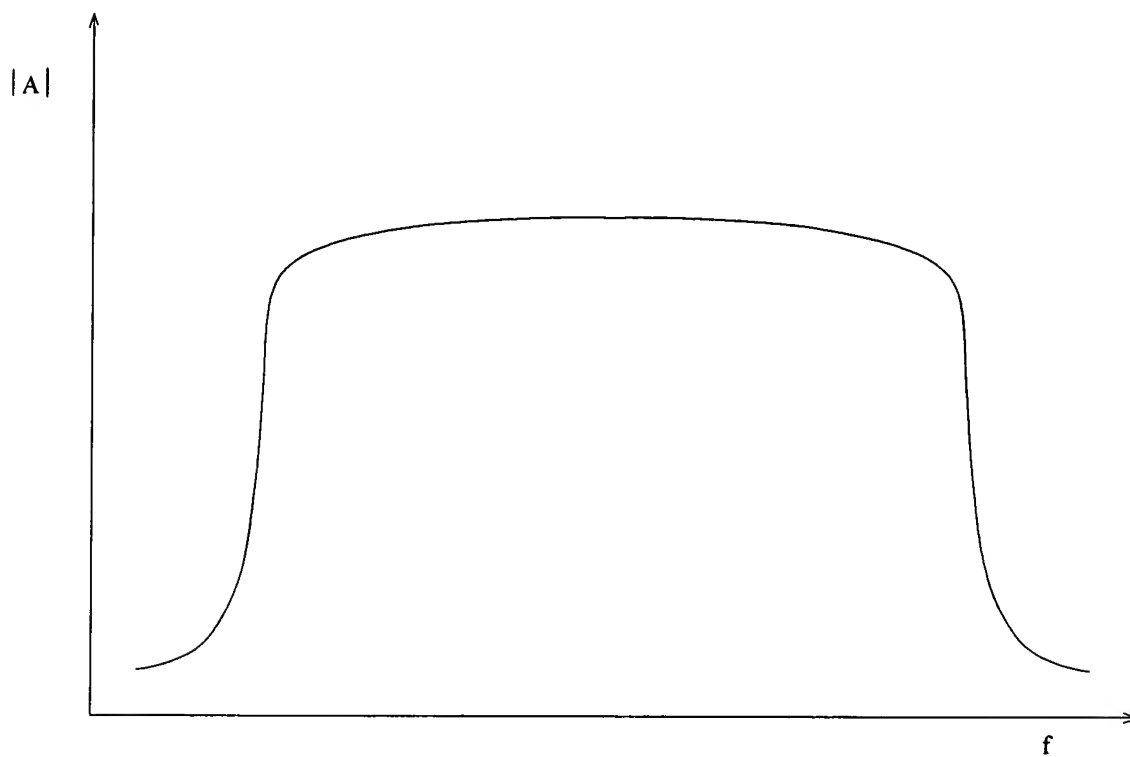


FIG. 6d

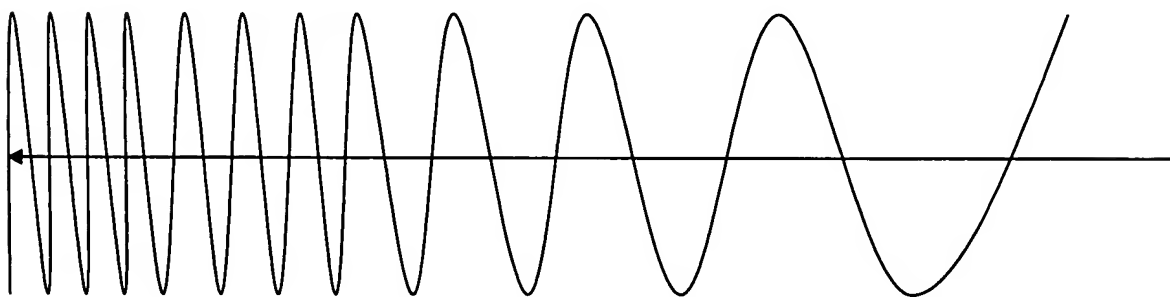


FIG. 6e

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Docket No.: U001 100014

6/7

Polarity	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	0	1	0	1	0	1	0	1	1	0	0	0	1	1	1	1
1	1	0	1	0	1	0	1	0	0	1	1	1	0	0	0	0

FIG. 6f

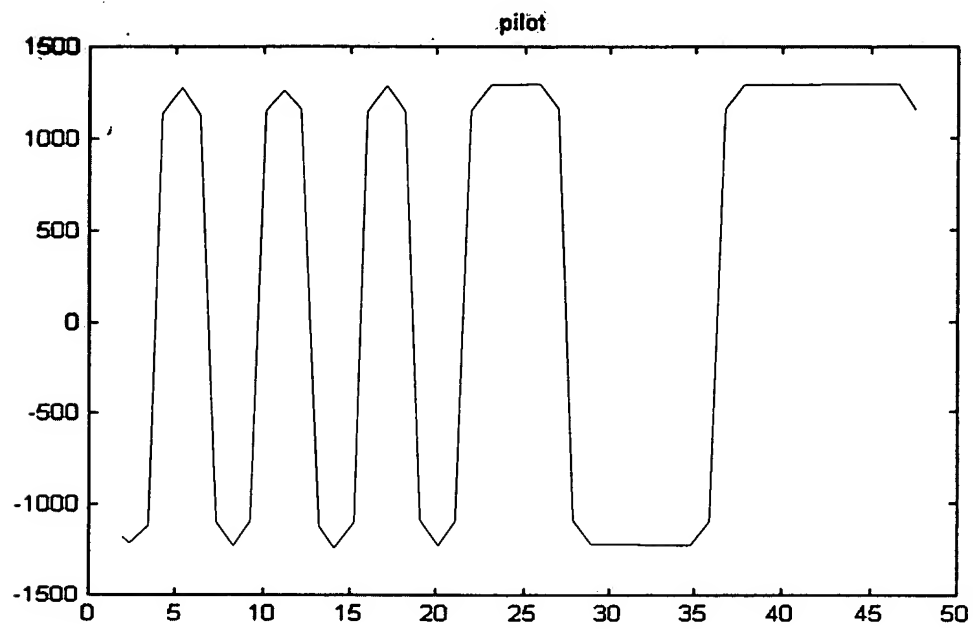


FIG. 6g

Docket No.: U001 100014

P	P	P'		P	P	P'		P	P	P'		Sync word	data

Diagram illustrating the timing of a data packet. The packet structure is shown as a sequence of fields: P, P, P', followed by a series of P and P' pairs, a Sync word, and data. The timing diagram below shows the signal levels for these fields, with time intervals labeled  $\Delta$ ,  $\delta$ , and  $\epsilon$ .

The diagram shows a sequence of signal levels over time. The fields are represented by horizontal lines. The timing intervals are labeled as follows:

- $\Delta$ : Time interval between the start of the first P field and the start of the first P' field.
- $\delta$ : Time interval between the start of the first P' field and the start of the first P field.
- $\epsilon$ : Time interval between the start of the first P field and the start of the first P' field.

FIG. 7